
Status & Remarks

The application presently contains the following claims:

<i>Independent Claim #</i>	<i>Dependent Claim #s</i>
1	2-7
8	9-17
18	19-27

Claims 1, 8 and 18 are amended in this response.

Support for the amendment limitation clarifying that the processes of the claims removed the thermal barrier coating from the substrate surface of the workpiece (Claim 1) or from the metallic surface of the cooling hole (Claims 8 and 18) can be found in the Abstract of the application, Paragraph 0009 of US 2005/0126001 A1 (the publication of the application at hand), and other locations throughout the application.

In the Specification

The applicant's attorney appreciates the Examiner's removal of the prior objections to the Specification. No objections are currently pending to the Specification.

Claim Objections

The applicant's attorney appreciates the Examiner's removal of the prior objections to the Claims. No objections are currently pending to the Claims.

35 U.S.C. §103

The Examiner has rejected Claims 1-13, 17-23 and 27 under 35 U.S.C. §103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of U.S. Patent 4,020,535 ("Cuneo" or "535 Patent").

The Examiner has further rejected Claims 14-16 and 24-26 as being unpatentable over AAPA/Cuneo, as applied to Claims 8-18 above, and further in view of U.S. Patent 6,663,919 ("Farmer" or "919 Patent").

The applicant's attorney would respectfully request that the Examiner revisit the rejections in view of the following arguments as associated with the amended pending claims.

The Examiner has represented that the AAPA discloses a method for removing a thermal barrier coating from a metallic substrate of a component wherein a waterjet system with or without particulate media (abrasive or non-abrasive) utilizing a liquid-containing jet which operates at high fluid pressures ranging from 5,000 psi to 50,000 psi is used in order to remove thermal barrier coating deposits. The Examiner supplements the teachings of the AAPA with those of Cuneo, which is represented to teach of using a dry air blast of glass beads at a pressure of 20 to about 100 psi to remove a coating from a substrate surface without affecting the substrate surface and that Farmer teaches directing the jet at an angle to its intended target. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made, to substitute the high pressure waterjet system of AAPA with the low pressure air blast of glass beads taught by Cuneo et al., in order to remove the desired amount of coating without affecting the substrate surface.

Applicant's attorney respectfully requests the Examiner to reevaluate his conclusion in light of the amendments made to the claims and in conjunction with the following technical arguments. Cuneo teaches of a method of using glass beads to remove portions of (*i.e. purposely damaging*) the substrate of the workpiece. Cuneo teaches that "the substrate blank with the developed pattern of protective material is then struck with a plurality of particles having a dimensional size and velocity to erode away a predetermined depth of the graphite substrate in the exposed pattern." [Column 4, Lines 19-23 (emphasis added)] Cuneo further teaches that "the entire surface of the substrate blank will be sprayed with the glass beads...circuit grooves correspond to roughly 15 mils in depth are created by the impact of the glass beads particles on the exposed graphite substrate." [Column 4, Lines 49-54]. Cuneo teaches of using the glass beads to remove portions of the substrate, while protecting other portions of the substrate by the application of protective material coating. [Column 4, Lines 15-25].

These teachings of Cuneo directly oppose the teachings of the current invention, namely to remove the thermal barrier coating from the substrate without damaging the substrate of the workpiece. The invention at hand teaches of directing a low pressure air jet with particulate media at a workpiece to remove the coating from the substrate, leaving the substrate unaffected.

More specifically, the Cuneo invention involves using a coating to protect areas of a substrate, while using glass beads to remove unprotected areas of the substrate. By contrast, the present invention

involves using an air jet containing particulate media to remove a coating from a substrate surface without damaging the substrate surface. A comparison of the Cuneo invention and the current invention is illustrated by the table below.

<i>Cuneo Invention</i>	<i>Invention of Present Application</i>
Protective coating is applied to portions of a substrate surface.	Thermal barrier coating exists on portions or all of the substrate surface.
Glass beads used to cut into unprotected portions of the substrate.	Particulate media used to remove thermal barrier coating.
Portions of the substrate are removed by the glass beads while the protective coating and substrate beneath the protective coating are both unaffected by glass beads.	Thermal barrier coating is removed by particulate media while the substrate is unaffected by the media.

The Cuneo invention teaches of purposely damaging and removing portions of the substrate of the workpiece that are not protected with the protective coating by using the air blast containing glass beads. Using the Cuneo invention, any portion of the substrate that is to be preserved must be protected by a protective coating before the glass beads are used. Conversely, the process of the invention of the present application was designed to have no affect and cause no damage to the substrate of the workpiece, whether covered or uncovered by the thermal barrier coating.

The following example is put forth to further illustrate the differences between the Cuneo invention and the invention of the current application:

1. A substrate surface is completely covered with the protective coating used in the Cuneo invention;
2. The covered substrate is subjected to the air blasting glass beads as explained in the Cuneo invention;
3. The result would be that there is absolutely no change to the covered substrate, as the air blasting glass beads of the Cuneo invention cannot penetrate the protective coating, and the protective coating and substrate below are undamaged by the process. The process of the Cuneo invention removes unprotected portions of the **substrate**.

Now, examine the results of the same example with the application of the current invention:

1. A substrate is completely covered with the thermal barrier coating used in the present invention;

2. The covered substrate is subjected to the air jet containing particulate media as explained in the present invention;
3. The result would be that the thermal barrier coating is removed from the entire surface of the substrate, while the substrate itself is unaffected by the process. The process of the invention at hand removes the thermal barrier coating from the surface of a substrate without damaging the substrate itself.

Farmer teaches of directing a jet at substantially the same angle as the cooling hole, however teaches of using a liquid stream from the jet. [Column 5, Lines 62-64].

Neither Cuneo nor Farmer teach of a method of using an air jet containing particulate media that does not damage the substrate of the workpiece, as is taught by the present invention. Rather, the prior art identified by the Examiner teaches of processes that do in fact damage the substrate. The process of the present invention uses “non-abrasive particulate media which is effective for the removal of thermal barrier coating deposits and does not result in wear erosion of the underlying metal substrate due to the low pressure process air and the inherent characteristics of the non-abrasive media that is used. The present process can be used an unlimited number of times on a component without significant wear and erosion.” [Page 1, Para. 009 of Publication 2005/0126001 A1]. The non-abrasive particulate media is preferably a dry spherical bead medium, and may be, but is not necessarily, glass beads, [Page 1, Para. 0010 and Page 2, Para. 0014].

Notwithstanding the foregoing, independent claims 1, 8 and 18 have been amended to clarify the foregoing and Applicant's attorney believes the amended claims clearly define over the prior art and that all claims are in position for allowance.

Request for Reconsideration

Applicant believes that all independent claims clearly define over the prior art and that the distinctions between the present invention and the prior art would not have been obvious to one of ordinary skill in the art. Additionally, the remaining dependent claims, by the limitations contained in the base independent claims, are believed to be patentable over the prior art by virtue of their dependency from independent claims which distinguish over the prior art of record. All pending claims are thought to be allowable and reconsideration by the Examiner is respectfully requested.

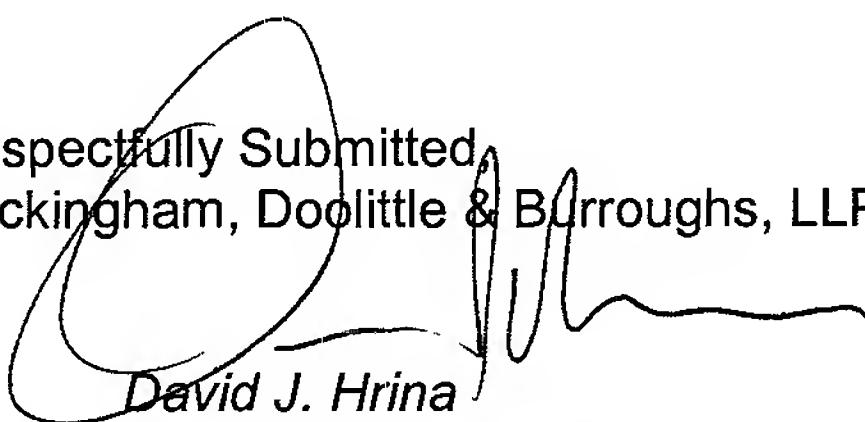
A fee determination sheet is attached for this amendment response. The Commissioner is hereby authorized to charge any additional fee required to effect the filing of this document to Account No. 50-0983.

Conclusion

If the Examiner believes that a telephonic conversation would facilitate a resolution of any and/or all of the outstanding issues pending in this application, then such a call is cordially invited at the convenience of the Examiner.

It is respectfully submitted that none of the cited references teaches of a process of using particulate media within an air jet to remove a coating from the surface of a substrate without damaging the substrate surface. For the articulated scientific reasons, coupled with the secondary factors discussed in the attached declaration of Stuart M. Shay, it is submitted that the invention as claimed meets all of the criteria for patentability.

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Respectfully Submitted,
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